

REMARKS

Claims 1-35 are pending in the application. Claims 18-31, 34 and 35 are rejected. Claims 1-17, 19 and 32-33 are herein canceled. Claims 18, 34 and 35 are herein amended. No new matter has been entered.

Objections

The Examiner objects to the amendment of claim 35. The Examiner asserts that it is not clear as to what has been amended since what is not underlined was “never previously presented before the Office”.

Applicants note that despite Applicants’ comments in the Response dated April 15, 2005 requesting acknowledgement of the preliminary amendment filed September 16, 2003, the Examiner is not acknowledging the preliminary amendment. Upon review of the online file image on the US PTO site, Applicants note that the preliminary amendment was broken into three different documents in the file.

That is, it is now comprised of “Preliminary Amendment” (1 page; page 1 of the preliminary amendment), “Claims” (9 pages; pages 2-10 of the preliminary amendment), and “Applicant Arguments or Remarks Made in an Amendment” (1 page; page 11 of the preliminary amendment), all of which are dated September 16, 2005. It appears that the Examiner has reviewed and considered only the document entitled “Preliminary Amendment” (1 page), which of course did not include any amendments.

Applicants note the above information for the Examiner, and request withdrawal of the finality of the previous office action and for consideration of the preliminary amendment.

Claim Rejections - 35 U.S.C. §102

Claims 18-31, 34 and 35 are rejected under 35 U.S.C. §102(e) as being anticipated by Yoshioka et al (U.S. Publication No. 2002-0043215 A1).

The Examiner asserts that Yoshioka et al. teaches an apparatus for gasifying a solid material comprising: a solvent removal chamber 120 provided with an inlet port 6E/7 of a gasification solvent containing a first solid material (Ba, Sr and Ti), [paragraph 0079] and a solvent (THF, tetrahydrofuran) in which it is dissolved, a heating device 131 that vaporizes the solvent used to prepare the gasification solution by heating that solution, and an exhaust port 129 that removes the vaporization product of the solvent, and a solid sublimation chamber (i.e., CVD Reactor) either also used as the solvent removal chamber or arranged communicably adjacent to it, and provided with a heating device that gasifies a second solid material separated by removal of the solvent by sublimation.

Applicants herein cancel claim 19, and move its limitations into claims 18 and 34. Thereafter, Applicants request reconsideration of the rejection, because not all of the claimed limitations are met by the cited reference.

As recited in the amended claims 18 and 34, the apparatuses of the present invention further comprise an opening and closing partition between the solvent removal chamber and the solid sublimation chamber. It should be noted that Yoshioka et al. neither teach a solid sublimation chamber nor an opening and closing partition for separating the solid sublimation chamber from a solvent removal chamber, although the Examiner has mentioned referring to Fig. 20 of Yoshioka et al that an open/close valve V6 corresponds to an opening and closing partition of the present invention.

The Examiner notes Applicants' contention that Yoshioka et al. fails to teach a first solid material is not directly gasified by sublimation from a solution containing the same, and Applicants' contention that Yoshioka does not disclose a sublimation chamber because there is no solid to sublimate. In response to Applicants' arguments, the Examiner cites Applicants background or related art as disclosed on page one of the present specification, in which Applicants note that organometallic compounds are sublimated solid raw material (powder) to form films after dissolving the solid raw material in a solvent, and therefore that Applicants' arguments are moot.

Applicants submit that Applicants' background section is irrelevant to the §102 rejection over Yoshioka et al. Applicants merely teach that thin film formation processes include sputtering, vacuum vapor deposition and chemical vapor deposition (CVD). The specification further teaches that an example of a process used to gasify solid raw materials in the case of forming a thin film of an oxide of an organometallic compound on the surface of a substrate by CVD. Such steps include sublimating the solid raw material powder, introducing the generated

reactive gas into a CVD device to be adhered onto a treated substrate (as in Japanese Unexamined Patent Publication (Kokai) No. 5-311446).

A second example mentioned in the Background is dissolving the solid raw material in a solvent such as tetrahydrofuran (THF), butyl acetate or hexane, vaporizing the resulting solution, and introducing the solution into a CVD device where it can also be adhered to a treated substrate (as in Japanese Unexamined Patent Publication (Kokai) Nos. 7-76778 and 10-298762).

Applicants note that the second example as contemplated in the Background section of the present specification is the same as or similar to that performed by Yoshioka et al. That is, Yoshioka et al. discloses a process in which organometals dissolved in THF and mixed into a solvent (paragraph [0079]) are supplied to a vaporizer (paragraph [0098]) to be vaporized *in a single step* prior to being forwarded into a CVD chamber. Although solvent 4D may be removed from the liquid substances prior to vaporization, the liquid substances by definition are not a solid, as required in the present claim 18. The liquid substances are vaporized from a liquid state to a vapor state (paragraph [0177]), and then carried to a CVD reactor via a carrier gas.

Applicants do not note where Yoshioka et al. teaches a sublimation chamber as in the present invention. Applicants further do not note an apparatus or process step in which a solid is left behind after the liquid carrier is driven off. Because the liquid and solid are vaporized at the same time, there is no solid to sublime.

The following are additional comments on the differences between the present invention and Yoshioka et al.

The gasifying apparatus of the present invention is directed to produce a target gas from a solid material through an intermediate gasification solution prepared by dissolving a first solid material in a solvent, and a second solid material produced upon removal of the solvent from the gasification solution, and comprises a solvent removal chamber and a solid sublimation chamber which are separated from each other by an opening and closing partition. After sublimation, a gas of the second solid material is supplied to a film formation chamber. In a preferred embodiment of the present invention, the gasification solution is supplied to the solvent removal chamber after the solution was absorbed in a solid carrier, preferably raw material cell 11 (Figs. 1 and 2).

According to the present invention, as fine particles of the second solid material can be produced as a function of the evaporation of the intermediate gasification solution, the second solid material can be effectively sublimed with heating in the solid sublimation chamber. Moreover, as described in the paragraph 0050 of the US specification, the treatment can be continuously and effectively carried out with the application of the opening and closing partition. These constitutional features of the gasifying apparatus and the resulting effects of the present invention are not described in Yoshioka et al. First, Yoshioka et al. neither describe a combination of the adjacent solvent removal chamber and solid sublimation chamber, nor an opening and closing partition separating these chambers, Contrary to the Examiner's observation that the solid sublimation chamber corresponds to the CVD reactor of Yoshioka et al., it should

be noted that according to the present invention, a film formation chamber recited in claim 34 corresponds to a CVD reactor.

Second, according to Yoshioka et al., the gasification solution is directly vaporized (not, sublimed) to use the resulting gas in the CVD reactor, contrary to the two step process, described above, of the present invention. It should be noted that the direct vaporization process is not suitable in the production of semiconductor devices, because it results in fine solid residues in the reactor as a result of prior evaporation of solvent from the solution (the solid material cannot be completely sublimed at such an evaporation temperature), and undesirable introduction of the evaporated solvent into the reactor, thereby causing an increase of the wafer surface temperature and reduction of the wafer surface as a result of the oxidative decomposition reaction of the solvent in the wafer surface.

For the above reasons, and in light of the addition of the limitations to the pending claims, Applicants request reconsideration of the rejections.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

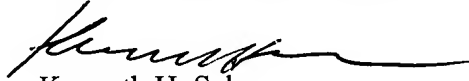
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If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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